

**\*\*NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE\*\***

## Measure Information Form

**Measure Set:** Surgical Infection Prevention (SIP)

**Set Measure ID#:** SIP-1

Set Measure ID #	Performance Measure Name
<b>SIP-1a</b>	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Overall Rate
<b>SIP-1b</b>	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - CABG
<b>SIP- 1c</b>	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Cardiac Surgery
<b>SIP-1d</b>	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Hip Arthroplasty
<b>SIP-1e</b>	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Knee Arthroplasty
<b>SIP-1f</b>	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Colon Surgery
<b>SIP-1g</b>	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Hysterectomy
<b>SIP-1h</b>	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Vascular Surgery

**Performance Measure Name:** Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision\*

**Description:** Surgical patients who received prophylactic antibiotics within one hour prior to surgical incision. \*Patients who received vancomycin or a fluoroquinolone for prophylactic antibiotics should have the antibiotics administered within two hours prior to surgical incision. Due to the longer infusion time required for vancomycin or a fluoroquinolone, it is acceptable to start these antibiotics within two hours prior to incision time.

**Rationale:** A goal of prophylaxis with antibiotics is to establish bactericidal tissue and serum levels at the time of skin incision. Studies performed in the 1960's and 1970's demonstrated that a common reason for failure of prophylaxis was delay of antibiotic administration until after the operation. In a study of 2,847 surgery patients at LDS Hospital in Salt Lake City, it was found that the lowest incidence of post-operative infection was associated with antibiotic administration during the one hour prior to surgery. The risk of infection increased progressively with greater time intervals between administration and skin incision. This relationship was observed whether antibiotics preceded or followed skin incision (Classen 1993).

Opportunities to improve care have been demonstrated and timely administration has been recommended. For example, at LDS Hospital, administration of the first antibiotic dose “on call” to the operating room was frequently associated with timing errors. Altering the system there resulted in an increase in appropriate timing from 40% of cases in 1985 to 99% of cases in 1998.

**Type of Measure:** Process

**Improvement Noted As:** An increase in the rate

**Numerator Statement:** Number of surgical patients who received prophylactic antibiotics within one hour prior to surgical incision (two hours if receiving vancomycin, in Appendix C, Table 3.8, or a fluoroquinolone, in Appendix C, Table 3.10).

**Included Populations:** Not Applicable

**Excluded Populations:** None

**Data Elements:**

- *Antibiotic Administration Date*
- *Antibiotic Administration Time*
- *Surgery Start Date*
- *Surgical Incision Time*

**Denominator Statement:** All selected surgical patients with no prior evidence of infection

**Included Populations:**

- *ICD-9-CM Principal Procedure Code* or *ICD-9-CM Other Procedure Code* of selected surgeries (refer to Appendix A, Table 5.01-5.08 for ICD-9-CM codes)

**Excluded Populations:**

- Patients who had a principal or admission diagnosis suggestive of preoperative infectious diseases (refer to Appendix A, Table 5.09 for ICD-9-CM codes)
- Patients who were receiving antibiotics within 24 hours prior to arrival (except colon surgery patients taking oral prophylactic antibiotics)
- Patients who were receiving antibiotics more than 24 hours prior to surgery (except colon surgery patients taking oral prophylactic antibiotics)
- Colon surgery patients who received oral prophylactic antibiotics only, as defined in the Data Dictionary for the data element *Oral Antibiotics*, and who received no antibiotics during stay
- Patients who are less than 18 years of age
- Patients with physician documented infection prior to surgical procedure of interest

**Data Elements:**

- *Admission Date*
- *Admission Diagnosis of Infection*
- *Antibiotic Name*
- *Antibiotic Administration Route*
- *Antibiotics During Stay*
- *Antibiotics Prior to Arrival*
- *Birthdate*
- *ICD-9-CM Other Procedure Code*
- *ICD-9-CM Principal Diagnosis Code*
- *ICD-9-CM Principal Procedure Code*
- *Infection Prior to Anesthesia*
- *Oral Antibiotics*
- *Surgery Performed During Stay*
- *Type of Surgery*

**Risk Adjustment:** No

**Data Collection Approach:** Retrospective data sources for required data elements include administrative data and medical records.

**Data Accuracy:** Abstracted antibiotics are those administered from the time of arrival through the first 48 hours after the surgery end time. Refer to Appendix C, Table 2.1 which contains a complete listing of antibiotics.

**Measure Analysis Suggestions:** Consideration may be given to relating this measure to SIP-2 and to SIP-3 in order to evaluate which aspects of antibiotic prophylaxis (i.e., timing, selection) would most benefit from an improvement effort. The process-owners for timing of administration of antibiotics, as assessed in this measure, may include clinicians and support staff on the nursing unit as well as in the presurgical holding area, as well as in the operating room itself. Opportunities may exist in any of these arenas which, when addressed jointly, can generate true process improvement.

**Sampling:** Yes, for additional information see the Sampling section

**Data Reported As:** Overall aggregate rate for all surgeries and stratified rates by data element *Type of Surgery*, generated from count data reported as a proportion.

**Selected References:**

- Bratzler DW, Houck PM, for the Surgical Infection Prevention Guidelines Writers Group. Antimicrobial prophylaxis for surgery: An advisory statement from the National Surgical Infection Prevention Project. *CID*. 2004;38(15 July):1706-1715
- Mangram AJ, Horan TC, Pearson ML, et al. Guidelines for prevention of surgical site infection, 1999. *Infect Control Hosp Epidemiol*. 1999;20:247-280.

- Silver A, Eichorn A, Kral J, et al. Timeliness and use of antibiotic prophylaxis in selected inpatient surgical procedures. *Am J Surg.* 1996;171:548-552.
- Larsen RA, Evans RS, Burke JP, et al. Improved perioperative antibiotic use and reduced surgical wound infections through use of computer decision analysis. *Infect Control Hosp Epidemiol.* 1989;10:316-320.
- Finkelstein R, Reinhertz G, Embom A. Surveillance of the use of antibiotic prophylaxis in surgery. *Isr J Med Sci.* 1996;32:1093-1097.
- Matuschka PR, Cheadle WG, Burke JD, et al. A new standard of care: administration of preoperative antibiotics in the operating room. *Am Surg.* 1997;63:500-503.
- Gorecki P, Schein M, Rucinski JC, et al. Antibiotic administration in patients undergoing common surgical procedures in a community teaching hospital: the chaos continues. *World J Surg.* 1999;23:429-432.
- Bernard HR, Cole WR. The prophylaxis of surgical infections: the effect of prophylactic antimicrobial drugs on the incidence of infection following potentially contaminated operations. *Surgery.* 1964;56:151-157.
- Polk HC, Lopez-Mayor JF. Postoperative wound infection: a prospective study of determinant factors and prevention. *Surgery.* 1969;66:97-103.
- Stone HH, Hooper CA, Kolb LD, et al. Antibiotic prophylaxis in gastric, biliary, and colonic surgery. *Ann Surg.* 1976;184:443-452.

## SIP-1: Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision

**Numerator:** Number of surgical patients who received prophylactic antibiotics within one hour of surgical incision (two hours if receiving vancomycin or fluoroquinolone).

**Denominator:** All selected surgical patients with no prior evidence of infection.













